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OXC-0281-67
Copy 1 of 10

7 March 67

MEMORANDUM FOR THE RECORD

SUBJECT : Status of OXCART Life Support Equipment Improvements

1. A life support meeting was held at [redacted] on 15-16 February, 1967, with representatives from Headquarters, [redacted] LAC, David Clark Co., Firewel Co., and [redacted] A meeting between LAC and the undersigned was also held 1 March 67 at Burbank. The following paragraphs summarize the items discussed and evaluated. 25X1A 25X1A 25X1A

2. Items Related to Accident of Aircraft #125:

a. Shoulder Harness Modification: Shoulder harness adjusting hardware is being removed from the straps to eliminate interference with the headrest and neck ring upon man/seat separation. When the modification is completed each project pilot will have an individually sized shoulder harness that will be inserted into the inertia reel strap at the time the pilot is inserted in the cockpit. Service Bulletin #1086 dated 22 Feb 67 applies, the straps are in production and should be available by mid-March.

b. Smooth Cover on Stabilization Parachute Pack: Firewel is developing this modification to reduce parachute/headrest interference. A prototype item should be available for evaluation in late March.

c. Ejection Seat Headrest Modification: LAC has completed the design, prototype construction and developmental testing of this modification. A service bulletin is being drawn up in order to obtain components. Qualification testing and final test reports will be available in the next few weeks. There is a probable lead time of at least two months to obtain parts necessary for retrofit of all OXCART aircraft. The test set-up and prototype headrest were reviewed on 1 March. This modification is highly desirable and the qualification program proposed seems quite satisfactory.

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d. Modification of Automatic Lap Belt Mechanism: This lap belt has been reworked and redesigned by LAC. The development and testing is complete and qualification testing is underway. Final test report and production items for installation should be available in early April. Service Bulletin #1093 has been issued.

e. Controller Cover: The cover designed by LAC was dropped from consideration for incorporation as a result of cockpit evaluation of the item. Firewel is submitting an ECP for producing stronger oxygen fittings in lieu of a controller cover which could never be constructed to protect these fittings.

f. Battery Pack for Emergency Visor Heat: The LAC mockup battery pack was reviewed at the 15-16 Feb meeting and it was determined that rigorous qualification testing would be required. Also Firewel is submitting an alternate proposal for locating the required batteries. On 1 March the status of the LAC prototype was again reviewed and discussed. Preliminary tests conducted by LAC indicate that the battery power available in the prototype pack will not keep the visor free of frost at -65°F. Testing of this nature is continuing. A great deal more basic information is required before a satisfactory solution will be produced.

g. D-Ring Cable Cutter: There is no valid requirement for such a modification and such a change would require a complete redesign of the OXCART ejection seat. It was therefore decided at the 15-16 Feb. meeting to drop this item from consideration.

3. Items Related to Improved Water Survival: The following items were discussed and evaluated during the 15-16 Feb. meeting.

a. Prototype Life Raft with Improved Boarding Capability: This item was evaluated at the swimming pool with respect to boarding, stability and comfort. All three characteristics received good response and the raft is judged to be an excellent improvement. David Clark Co. is presently working on further improvements such as a blast bag for the CO_2 inflator, spring spreaders in the stability buckets, and reduced bulk and weight for improved packing.

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The raft should be available for evaluation again in mid-March at which time the tentative plan is to evaluate the raft in a more realistic environment than a swimming pool.

b. Prototype Outer Coverall with Flotation Collar, Relocated Inflator, and Improved Leg and Pocket Drains. This coverall was evaluated in the cockpit with respect to parachute, shoulder harness, and lap belt compatibility. The prototype was found to be compatible providing the inflator lanyard knobs were reduced in size. These are being changed by David Clark. One question to be answered on the next evaluation is whether rapid removal of the parachute chest strap is hindered by the flotation collar. The swimming pool evaluation of the coverall showed the flotation collar provided guaranteed face-up flotation for an incapacitated pilot; serves as an excellent redundant system in the event the primary flotation vest fails; does not hinder life raft boarding; and does not hinder parachute harness removal to any significant extent. The leg and pocket drains worked excellantly and the relocated inflator could be easily reached and activated by either hand while suspended in the harness. The major problem encountered was that the inflated collar made it difficult to locate and release the parachute canopy releases. David Clark is redesigning the collar to overcome this problem and the coverall should be ready for further evaluation in mid-March.

c. Automatic Inflators: Two automatic, water activated, CO_2 inflators were evaluated during the pool tests. Both items functioned perfectly and in one case the inflator was used on the prototype collar with very satisfactory results. LAC is preparing a qualification test report for these inflators which will be submitted in the near future. David Clark is also modifying the collar to accept the automatic inflator.

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d. Automatic Life Raft Boarding System: LAC presented a status report on this item which revealed the raft was still too large to allow adequate packing of sufficient survival equipment in the seat kit. LAC is continuing work on this system, however, it necessarily represents a low priority item.

4. Cockpit evaluation of Head-to-Headrest Distance for All Project Pilots: In order to determine if some action was required to insure that all pilots could reach the headrest during

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ejection now that the spacers were removed, measurements were made for all project pilots in the cockpit with suits both pressurized and unpressurized.

a. Results of Evaluation:

SUBJECT	TYPE HELMET	HELMET-TO-HEADREST DISTANCE (INCHES)		
		UNPRESSURIZED	PRESSURIZED	
			NO ADJUSTMENTS	TIE-DOWN & KIT STRAPS LOOSENED
25X1	Standard	0	3¼*	3¼
	Standard	0	3/4	3/4
	Large	0	0	N/A
	Large	0	2¼	1
	Standard	0	2¼	2
	Standard	0	0	N/A
	Wide	0	0	N/A

25X1 *[redacted] was not wearing his own custom fitted suit but was using one which was too large. In the pressurized conditions the suit inflation carried the parachute up his back and prevented him from getting back further in the seat.

b. Conclusions: Since all pilots could reach the headrest while unpressurized it was apparent that no modification or changes were required. In the four cases where the pilot could not reach the headrest when inflated, the pressurized suit was the cause and not the construction of the parachute as had been suggested by LAC. In the inflated state the pressure suit provides enough support and rigidity in the head/neck region to make it unnecessary for the pilot to be able to reach the headrest during ejection. It was also found that the head to headrest distance could be improved in some pilots (while pressurized) by loosening the seat kit straps. This procedure was recommended to

25X1A [redacted] life support division for incorporation as an SOP.

5. Other Items Related to Previous Accidents: The following items were discussed and evaluated during the 15-16 Feb. meeting.

a. Positive Visor Hold-down latch: David Clark displayed a helmet with a mechanical, positive locking visor latch attached to the lower left portion of the

visor/helmet. The latch was constructed to allow the pilot to continue to raise the visor using only one hand. The helmet was left at [redacted] for evaluation by the project pilots. [redacted] is to provide comments and recommendations on this item before further action will be taken.

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b. Automatic Survival Kit Deployment Feature: Rocketjet Corp. displayed and demonstrated an OXCART seat kit with this feature. They are presently modifying four kits for evaluation (not including flight evaluation in OXCART aircraft). A cost proposal and proposal regarding qualification testing is to be submitted via Firewel. However, since this item will be costly, may have a long lead time before it can be incorporated, and cannot be considered a safety-of-flight modification, it may not be feasible to proceed with the development. Further considerations will be given once the [redacted] proposals are submitted.

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c. URT-27 Beacon Installation in Parachute: Firewel displayed and demonstrated the latest beacon installation provisions. Firewel is attempting to reduce the bulk of this installation and will submit an ECP in the near future. High speed deployment tests may be required to qualify this item. At the request of [redacted] LAC is to investigate the feasibility of installing a second beacon on the ejection seat to be automatically activated upon ejection.

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ASD/OSA/[redacted] (7 Mar 67)

Distribution:
1 - ASD/OSA
2 - D/SA
3 - D/R&D/OSA
4 - D/M/OSA
5 - D/O/OSA
6 - OXC Div/O/OSA
7 - CABLE [redacted]
8 - CABLE
9 - ASD/OSA (Chrono)
10 - RB/OSA

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